

OCT 1 1900

THE
GEOLOGICAL MAGAZINE.

NEW SERIES. DECADE IV. VOL. VI.

No. IX.—SEPTEMBER, 1899.

ORIGINAL ARTICLES.

I.—NOTE ON THE DISCOVERY OF *MIOLANIA* AND OF *GLOSSOTHERIUM*
(*NEOMYLODON*) IN PATAGONIA.

By FRANCESCO P. MORENO, F.R.G.S., Corr.M.Z.S.Lond.,
Director of the La Plata Museum.

SINCE 1877, when I discovered the Tertiary Mammalian beds of Santa Cruz, in Patagonia, I have been looking for proofs of the ancient connection between the new uplifted lands of the southern part of the American continent and the other lands of the Southern Hemisphere—Africa and Australia. During my subsequent travels in the interior of the Argentine Republic, including Patagonia, my interest in that connection has been increasing, and I have discovered additional evidence, which showed me the former greater extension to the east, in comparatively modern times, of the actual existing lands. The splendid results of the researches made by the La Plata Museum in Patagonia have revealed a great number of lower forms of vertebrates, including numerous marsupialia, some of which seem to me closely related to the mammals of the Pleistocene fauna of Australia, and among them *Pyrotherium* with *Diprotodon*. I think that my suggestion has an indubitable confirmation in the discovery made by the expeditions which I sent in 1897 and in the first months of this year, under the direction of Mr. Santiago Roth, expeditions that have had astonishing results.

In beds containing remains of mammals and dinosaurians, Mr. Roth discovered in 1897 a caudal sheath-ring, very similar to those of the *Glyptodon*, but which I at once recognized as pertaining to a form like the chelonian of the Pleistocene of Queensland, described by Owen. I brought this fossil with me to London for comparison with the remains of *Miolania* preserved in the British Museum (Natural History). The resemblance was great, but the fact of a Tertiary chelonian from Patagonia being analogous to the Pleistocene genus from Queensland and Lord Howe Island was so astonishing, that some doubt was permitted; but, having previously ordered a new examination of the fossiliferous bed where the remains were found, I have now the certainty of the extremely close relation between the Australian and Patagonian chelonian. I have received

several photographs of a skull discovered by Mr. Roth, which photographs, when compared with the Australian specimens in the British Museum (Natural History), give no place for doubt upon this matter. I think that it is sufficient for the present to give two

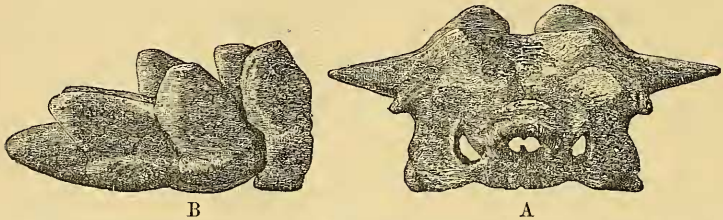


FIG. 1.—Front view of skull (A) and side view of tail-sheath (B) of *Miolania Oweni* (greatly reduced), from Pleistocene Deposits, Queensland, Australia. [Originally described as *Megalania prisca* (Owen, 1880).]

cuts representing the two forms of *Miolania*. I expect in a few days the original specimen from Patagonia, together with various bones and additional remains of the caudal sheath, with some of the carapace. These will be the subject of a special description by Mr. Arthur Smith Woodward, who has so kindly commenced studies on the fossil reptiles in the La Plata Museum.

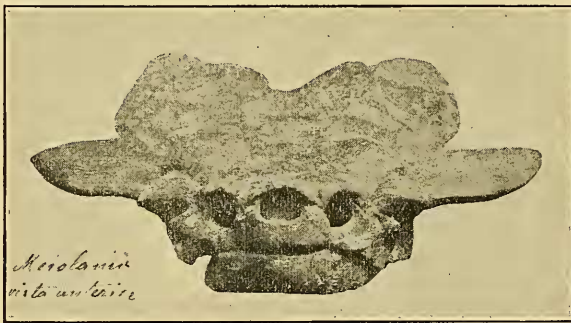


FIG. 2.—Reproduction of photograph of the front view of skull (with the lower jaw) of *Miolania*, obtained in 1899 from Patagonia by Mr. Santiago Roth, of the La Plata Museum, Argentina. (Greatly reduced in size.)

I have also brought with me to London a piece of a skin discovered in a cave near Last Hope Inlet (lat. S. 51° 30'), which I have referred to a species of the extinct *Mylodon* (see, "On a Portion of Mammalian Skin, named *Neomylodon listai*, from a Cavern near Consuelo Cove, Last Hope Inlet, Patagonia," by Dr. F. P. Moreno, C.M.Z.S.; with a description of the specimen by A. Smith Woodward, F.Z.S.); while Mr. Ameghino has announced that another piece of the same skin pertains to a mammal still living, of small size, which he has called *Neomylodon*. When I took this piece at Last Hope Inlet in

November, 1898, I was convinced that it was part of the skin of a *Myiodon* or a form very similar to it, and that the discovery was of great importance to me, as I think that the Pampean muds, where the extinct Edentata are found, are of very modern age, an opinion contrary to that held by another observer, Mr. Ameghino, who refers the Pampean fauna to the Tertiary age. I have already maintained that the extinction of the greater part of the Pampean fauna took place after the presence of man in a relatively advanced culture, called Neolithic culture. Having, then, great interest in the continuation of the investigations in the cave, I ordered, before coming to London, more extensive researches, and these have been made with very successful results.

Dr. Otto Nordenskjöld had previously obtained in 1896 a piece of the same skin, which, it is known, was discovered by a party of Argentine surveyors during the preliminary studies for the boundary between Argentina and Chili in the Andean Cordillera, and, recognizing also the importance of it, Dr. Erland Nordenskjöld went last year to the same spot to look for some more remains. The excavations which he made gave him, so far as I know, some bones, pieces of jaws, teeth, and claws of the same animal, but he did not obtain more remains of the skin.¹ My assistant, Mr. Hauthal, arrived later at the cave, when Dr. Erland Nordenskjöld had terminated his researches, and commenced further exploration. He obtained, not only skulls, jaws, teeth, bones, and claws, but also a nearly complete skin of the animal, which shows that it is a *Glossotherium*, together with bones of *Macrauchenia*, *Equus*, and *Auchenia*, also a great quantity of dung, hay cut by man, ashes, and some bones worked by man. I am not yet sure if the bones of man discovered by Mr. Hauthal were found in the same cave or in one of those in its neighbourhood; but the presence in the *Glossotherium* deposit of bones worked by man is a proof that man and other mammals, whose remains have been discovered in the cave, were contemporary. I suggest that the skin has been preserved by man for bedding. In the caves inhabited by ancient man in Patagonia I have seen cut hay, and probably this also was used for beds.

I expect to receive in a few days all these specimens at the same time as those of the *Miolania*, together with reports on the discoveries, and I think they will arrive in time for me to exhibit these remains at the meeting of the British Association at Dover.

The discovery made by Mr. Roth of some advanced Mammalia in the beds that contain dinosaurians, and Mr. Hauthal's discovery of remains of extinct vertebrates and other mammals in the caves of Southern Patagonia, associated with *Macrauchenia*, horse, *Auchenia*, and man, are proofs of the very recent changes in the physical geography of Patagonia, and afford most interesting problems, which can only be solved by a systematic examination of the Argentine country by experienced geologists. In the course of my paper read before the Royal Geographical Society, I proposed that this Society,

¹ E. Nordenskjöld, "Neue Untersuchungen über *Neomyiodon listai*": Zool. Anzeiger, vol. xxii (1899), pp. 335, 336.

the Royal Society, and the British Museum, with other scientific institutions, should proceed to carry out these necessary investigations. These problems are not extraneous to the explorations which may be carried out by an Antarctic expedition, and I think the new discoveries which I now communicate to the GEOLOGICAL MAGAZINE may urge on the dispatch of such expeditions as I propose. If these expeditions be made, how many changes may be produced in actual and general ideas on the age of the South American fossiliferous strata, on the disappearance of the lost southern lands, and on the affinities of extinct faunas so distant in time and space as those of South America and Australia.

II.—CONTRIBUTIONS TO FOSSIL CRUSTACEA.

By Professor T. RUPERT JONES, F.R.S., F.G.S., and HENRY WOODWARD, LL.D., F.R.S., F.G.S.

(PLATE XV.)

THE following notes are devoted to a small series of Crustacea, not directly related to one another, but which have been awaiting a favourable moment for description.

1. BELLINURUS GRANDÆVUS, Jones & Woodw. (Pl. XV, Figs. 2 and 3; $\times 6$ diam.)

Through the kindness of our friend Dr. Henry M. Ami, M.A., F.G.S., Assistant-Palæontologist to the Geological Survey of Canada, and with the permission of the Director, Dr. G. M. Dawson, C.M.G., F.R.S., we received, a year ago, two tiny specimens of Palæozoic Limuloid Crustaceans, referable to the genus *Bellinurus* of König. Dr. Ami writes:—"The precise locality of these protolimuloid Crustaceans is the 6th cutting east of Riversdale Station on the Intercolonial Railway of Canada, in the county of Colchester, Nova Scotia. There are besides this Crustacean (which you are at liberty to describe if you wish) a number of plant- and animal-remains associated in the same beds, viz.: *Asterophyllites acicularis*; *Sphenopteris*, sp.; *Cyclopteris (Aneimites)*, sp.; Ostracoda; *Anthracomya obtenta*, etc., etc. A species of *Leaia*, closely related to *Leaia tricarinata*, also occurs here, and fern-pinnules allied to *Neuropteris*, besides *Calamites*, *Cordaites*, etc. The shales from which these Crustaceans were obtained are overlain conformably by sandstones and red shales of great thickness, and these in turn are unconformably capped by Lower Carboniferous Marine Limestones. Thus, in descending order the strata are:—

1. Lower Carboniferous Marine Limestones.
(Unconformity.)
2. Red rocks of Union and Riversdale Series.
3. Black, grey, and glossy shales of Riversdale and vicinity.
(Unconformity.)

1. Turning to the specimens themselves, the label states "the first specimen found by Mr. Ami" (which is represented on Pl. XV, Fig. 3, enlarged six diam.) is said to be from the "3rd cutting